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The Microchipping of America: Human Rights Implications of Human Bar Codes

Abstract: The implantation of microchips into human beings has spurred a recent firestorm of controversy. This year VeriChip Corp., the nation's main manufacturer and purveyor of human microchips, went out of business in the wake of ten-year studies confirming that microchip implants had induced malignant tumors in animals. Nevertheless, the microchipping controversy is far from settled; as the industry retools for potential redevelopment of human microchips, we must engage in serious discussion of this topic. Human microchipping in an experimental setting (whether informed or not) raises issues regarding U.S. and international human rights law, potentially violating standards of human experimentation under the Nuremberg Code, the U.S. Constitution, federal statutes, and case law. One instance of such violation arguably occurred when VeriChip recently implanted hundreds of Alzheimer's patients. Among other issues, this action by the company raises questions regarding informed consent; the fact that Alzheimer's patients are arguably not competent to provide consent points to a potential human rights violation by VeriChip under the Nuremberg code and other law. Advances in human microchipping technology, including its use in gene therapy and the recent trend toward fusion of DNA and RFID technology in a microchip, create the potential for additional peril, including DNA alteration.

Table of Contents:

- I. Introduction
- II. Background on Human Microchipping and Human Rights

A. A Brief History of Human Microchipping

B. Current Applications and Trends

C. Problems

1. Health Risks

2. Human Rights Risks

(a) Neo-eugenics

(b) Secret Human Experimentation

III. Applicable Law

A. Nuremberg Code

B. Domestic Law on Human Experimentation

1. Judicial Treatment of Human Microchipping

(a) Federal Courts

I. Introduction

While incarcerated at Fishkill Correctional Facility, at the urging of prison doctors, New York resident Brian Wronge agreed to undergo a surgical procedure. After the operation, however, Wronge began suspecting that the surgeons had somehow tampered with him while he was on the operating table. Sure enough, upon his release, Wronge subsequently underwent separate CT scans, MRIs, and physical examinations that all showed the presence of “metal foreign objects” implanted in his head, chest, and ears. In possession of this evidence that he had been implanted with “paramagnetic metallic foreign bodies,” or microchips, without his knowledge or consent, Wronge filed suit in federal court. However, the district court judge refused to let his case proceed unless Wronge had the suspected microchips surgically removed. Unsurprisingly, Wronge was unable to locate any physicians who would perform the procedure, and therefore found his lawsuit irremediably frustrated.

The new technology of human microchipping is fraught with potential risks and benefits. Microchipping may carry valuable benefits in the areas of health care, security, and finance. However, with physical risks including cancer, gene-therapy-related death, and other possible genetic dangers; and social risks such as loss of privacy,

harassment, violations of the Nuremberg Code and U.S. laws, and the rebirth of the eugenics movement, the time has come for a serious examination of all aspects of our new ability to implant microchips into human beings.

While controversy and opposition to human microchipping have been mounting for years, the issue became explosive after the release of 10-year scientific studies concluding that microchip implants caused cancer in a significant percentage of implanted laboratory animals. VeriChip, the industry leader in human microchip manufacturing, marketing, and distribution, promptly went out of business, reportedly sold to another private company. The issue, however, is far from defused; as the industry retools for the inevitable redevelopment and re-marketing of human microchip implants, we must immediately devise solutions to the problems revealed by the first round of experimentation in this area.

The mainstream media has failed to thoroughly explore the issue of implanting humans with microchips (or "chipping"), and only a handful of scholarly articles have addressed this topic. What little legal analysis scholars have undertaken on the subject has focused on privacy issues. However, none debating the issue of microchipping have answered what seems to be a basic question: does the implantation of microchips into human beings comport with established principles of human rights law? If so, have questions surrounding the element of informed consent been adequately addressed in regard to chipping Alzheimer's patients, children, and others arguably incompetent to give informed consent to the procedure? Moreover, though the idea of coerced implantation has been universally deplored – at least in public – what measures should be enacted to assure that such abuse does not occur?

A relatively new procedure, human microchipping remains in its experimental stages. Human rights laws articulate specific standards regarding the treatment of human subjects of medical experimentation. Under the Nuremberg Code, such experimentation without procuring informed consent from a human subject is explicitly forbidden.

Unfortunately, many who have already been “chipped” have arguably been incapable of giving informed consent to the procedure, due to questions of competency. In addition, America's regrettable history of covert experimentation on its citizens demands that the federal government adopt a preemptive stance and enact measures that will be effective in helping to prevent such abuses in the future. Unfortunately, neither Congress nor the judiciary has provided effective guidelines for protecting human and civil rights in reference to human microchipping.

Such regulatory lapses effectively strip subjects of all legal recourse under the current system. Courts almost invariably dismiss the suits of plaintiffs litigating on the basis of suspected uninformed implantation, on grounds of the "frivolousness" of supposedly "delusional" claims – despite the fact that human microchipping has been publicly reported for almost a decade. The few litigants who have managed to show evidence that they have, indeed, received unauthorized implants have subsequently been denied due process. In such situations, courts have insisted that the plaintiffs have the chips removed before the litigation can continue; plaintiffs are inevitably frustrated to find that no medical provider will remove the chips (possibly for fear of recrimination from the government). Partly in response to this quandary, a number of states have recently passed acts banning coerced microchipping. However, Congress remains silent on the issue.

Even fully informed, consented microchipping raises human rights concerns. Technology's recent exponential expansion has led to the development of "biochips" that combine computer circuitry with human cells, DNA, and other biological elements. In 2008 news sources reported that, after connecting human subjects to certain computer systems, scientists are now able to literally project the mental images of such subjects (both conscious and unconscious) onto computer monitors. Such innovations hold great potential benefits for medical science; however, they also create bioethical issues with significant implications for human rights and for humanity in general. Now is the time for Congress to begin internal deliberations and engage with existing global efforts to confront the consequences of rapid technological advancement in this area.

Proponents of human microchip implantation often argue in favor of the procedure using either a medical or a public health model as a rationale. Indeed, microchipping could potentially provide medical benefit to a specific "high-risk" segment of the population that suffers from serious and debilitating disease. Nonetheless, as I argue below, neither a medical nor a public health model adequately addresses the complex issues surrounding human microchipping.

I plan to present three separate models for microchip implantation in human beings. Ultimately I intend to articulate a rationale for banning all coerced microchipping, and for implementing significant limitations upon consented microchipping, based upon the significant health and social concerns implicated by the procedure.

Any comprehensive legal strategy to address the issue of human microchipping must include responses from all three branches of government, and must also acknowledge

the possibility of misuse in the form of uninformed implantation or other coercion. In Section II I present a brief history and background of human microchipping, including the technology's current applications, trends, and dangers. Section III explores applicable international and domestic law, including the Nuremberg Code, U.S. Code, relevant state statutes, and judicial precedent. Section IV explores, and ultimately rejects, the two paradigms most commonly used by those who have analyzed the issue of human microchipping. I conclude with Section V, in which I present a human rights model as the preferred paradigm and propose the implementation of a presidential task force, federal legislation, and adjudicative standards aimed at protecting both informed and coerced subjects. My proposals should significantly minimize current problems surrounding the issue.

II. Background on Human Microchipping and Human Rights

The current situation reveals a stark split between state legislatures and the federal government, including the federal courts. While state legislatures have acted precipitously to ban coerced human microchipping (and to set limits on consented microchipping), Congress has ignored the issue completely. Moreover, federal courts appear to have clung to a state of staunch denial that human microchipping even exists. Though the media reports that thousands of Americans have consented to receiving microchip implants, federal courts appear to have thrown out every one of the growing number of lawsuits in which plaintiffs claimed to suspect having been subjected to coerced microchip implantation.

A. A Brief History of Human Microchipping

Digital Angel Corp. invented the technology for a GPS (Global Positioning System) implant, patented in 1999. That company was subsequently acquired in 1999 by Applied Digital Solutions, with financial backing by IBM. Applied Digital announced that, with the use of RFID technology, its GPS implant could continuously send and receive data, thereby helping to locate missing persons and provide medical monitoring. In 2004 the U.S. Food and Drug Administration gave its approval for Applied Digital Solutions to market the VeriChip, a human-implantable computer chip, for medical purposes. VeriChip Corp., a subsidiary of Applied Digital, manufactured the VeriChip. In 2007 VeriChip was on track to complete an initial public offering and to double its 2006 reported sales figure of 1.7 million microchips. Scott Silverman, VeriChip Corp. CEO, appeared to have met his stated goal of creating “the first RFID company for people.”

An implantable chip consists of a hermetically sealed glass capsule containing a microchip and a coil of copper wire, which acts as an antenna that transmits a radio signal. A passive, implantable computer chip bears a “unique” identification number, and lies dormant under the skin until it is read by an electromagnetic scanner. Such a handheld scanner or portal can read the 10-digit identification number and transmit it to a remote database that carries the implantee's personal information.

The VeriChip is small enough to be injected with a syringe during a procedure that takes minutes and results in a "human bar code" holding 128 characters of data.

VeriChip's first human implantee was New Jersey surgeon Richard Seelig, a medical consultant to Applied Digital Solutions. Victim identification difficulties following the 2001 World Trade Center terrorist bombing inspired Seelig to inject two microchips into

himself. A first wave of implantees soon followed. So as to skip long lines at the velvet ropes and buy drinks by having their arms scanned, regulars at Barcelona's Baja Beach Club have paid to be chipped, thus using their implants as a payment method similar to a credit or debit card. During the summer of 2007, VeriChip launched a pilot program involving the microchipping of hundreds of Alzheimer's patients at a Florida facility.

B. Current Applications and Trends

VeriChip aggressively marketed its microchips to people suffering from maladies including Alzheimer's, diabetes, heart disease, and cancer.

At a doctor's office or hospital, scanning an incoming patient's microchip can enable health care workers to access a patient's identity and complete medical history. This could particularly benefit “high-risk” patients, who might be admitted to hospitals while unconscious or otherwise unable to identify themselves. Applied Digital claimed that its VeriChip could assist in applications including supervision of chemotherapy, infertility management, and observation of postoperative patients.

Microchips provide continuous monitoring; via a microchip implant, changes in metabolic data can be immediately transmitted to patients' health care providers. Notice of a dangerous drop in a diabetic's blood-sugar level, for instance, can be sent to a nearby hospital via an emergency alert system.

Implantable microchips have also been widely promoted for their potential to efficiently combine security, personal identification, and cash transaction applications. This reportedly intrigued United States government officials, who have long sought ways to combine cash-less electronic payment technology with a national identification system.

VeriChip had approached homeland security, law enforcement, and other sectors, to promote the chip's uses in various high-security applications. In 2006 VeriChip was reportedly seeking Pentagon approval to implant microchips in all U.S. servicemen and servicewomen; company CEO Scott Silverman reportedly suggested that the U.S. government employ microchipping to track immigrants and guest workers. In lieu of issuing employees scannable ID badges, some businesses and government offices began microchipping employees as a security measure.

Use of RFID technology to track people continued to rapidly expand. By 2007, VeriChip Corp. reported that about 2,000 humans worldwide had voluntarily "taken the chip." By early 2007, VeriChip had spent millions of dollars to enlist more than 500 hospitals and 1,200 physicians to participate in its VeriChip Corporation Patient Identification System network. Elementary schools worldwide have embraced the idea of using RFID to continually track students.

Advances in medical science have opened up even more possible applications for human microchipping. In 2000, engineers at the University of California at Berkeley announced that they had discovered a means to combine a human cell with computer circuitry. Boris Rubinsky and Yong Huang claim that their "bionic chip" can assist in medical applications including gene therapy and genetic engineering. Although its usefulness is still debated, gene therapy may treat disease by introducing DNA into a patient to alter or replace the patient's existing defective genes. Biotechnology companies have, for instance, worked toward a gene-based flu vaccine. This form of gene therapy, which would involve extracting genes from the flu virus and injecting it into humans, has

undergone testing in cancer and AIDS patients.

Another new technology, the DNA microarray, has recently appeared. Also referred to as the “genome chip,” “DNA chip,” or “biochip,” the device monitors the entire genome on a single microchip. Genome chips are like computer chips, but are embedded with DNA molecules. A single experiment using one such chip can give researchers information on the interactions of thousands of genes at once. Developed by scientists in conjunction with the Department of Energy, this technology can immediately screen patients for thousands of genetic diseases and mutations. At present, genome chips can be used only once. However, if the technology continues to expand at its current exponential pace, it may soon be possible to create an injectable DNA chip that would constantly monitor — or even control — an implantee's genetic activity at all times.

It seems almost inevitable that RFID microchips and DNA chip technology would eventually unite. In 2006, RFID company Advanced ID Corporation announced a partnership with DNA technology company Manakoa Services Corporation. The move was hailed as the “first marriage of molecular biology at the ... DNA level, coupled to radio frequency identification. ...” Combination RFID / DNA microchip technology is too new for anyone to foresee its future course with certainty. Nonetheless, it is reasonable to predict the eventual development of an injectable, computer-controlled microchip that can not only continually monitor an implantee's metabolic processes, thoughts, and sensory experiences, but can also permanently alter an implantee's DNA.

C. Problems

1. Health Risks

VeriChip's stock plummeted after a 2007 Associated Press report revealed ten-year studies directly linking implanted microchips to the development of malignant tumors in 1-10% of laboratory animals. A toxicologist who led one such study at Dow Chemical confirmed that the microchips caused the tumors.

The Associated Press reported that lab mice and rats implanted with chips sometimes developed subcutaneous sarcomas encasing the implants. There has also been at least one case of cancer developing in a pet dog that had been microchipped. After reviewing the findings, Dr. Robert Benezra, head of the Cancer Biology Genetics Program at New York's Memorial Sloan-Kettering Cancer Center, and other prominent cancer researchers averred that they would not allow family members to be microchipped.

Following these developments, VeriChip reportedly sold its assets. The fate of human microchipping technology remains to be seen. Some would likely argue that, in the wake of revelations of the risk of cancer, the human microchipping venture is out of business, and no further action on the issue is needed. Considering the amount of interest generated, however, it is fair to surmise that chipping will continue after a period of restructuring, reevaluation, and remarketing.

Microchipping poses other health concerns. Once implanted, injectable microchips can be nearly impossible for medical authorities to locate; removing them may require the use of X-rays, monitors, and plastic surgery. The issue of gene therapy was also complicated recently by reports of at least one death resulting from the procedure. This is significant since human microchipping (in the form of biochips) has already been touted as a potential aid in administering gene therapy.

Microchips may continue to play a large part in the rapidly-advancing field of genetic engineering. In his book *REMAKING EDEN: HOW GENETIC ENGINEERING AND CLONING WILL TRANSFORM THE HUMAN FAMILY* (1998), Princeton embryologist Lee Silver predicts that, within several years, parents will be able to inject genes that will genetically re-program their children. Again, biochips or DNA chips may well play a part in such genetic alteration.

Some caution that, considering humanity's lack of experience in this area, such a course of action could lead to mutations. After generations of artificial gene selection, humanity could even divide into separate species.

2. Human Rights Risks

(a) Neo-eugenics

Others note a neo-eugenic slant to genetic engineering, and express fears regarding social implications of creating mutations that could irrevocably divide the human species. In his article "Self-Made Man?," Richard Hayes announces that such potentially neo-eugenic research is marching resolutely forward. He points as an example to a Canadian firm that has been developing artificial chromosomes that would restrict procreation to couples sharing the artificial chromosome. That, Hayes points out, is "the biological definition of a separate species." In the worst-case scenario, he says, such experiments "could aid and abet the development of new eugenic practices that would ... collapse the foundations of our common human nature."

Some unabashedly promote such a fundamental alteration of humanity. Speaking before Britain's Parliamentary and Scientific Committee, James Watson, the Nobel Prize

winner and now-disgraced former chancellor of Cold Spring Harbor Laboratory, asked rhetorically, “If scientists don't play God, who will?” The World Transhumanist Association advocates genetic engineering to create a post-human species, and was invited to advise the European Commission and the American Association for the Advancement of Science.

Just as significant are the potential social results of an approaching future in which parents may be able to genetically alter their children's skin color or hair texture. Hayes points out that even “technically safe procedures can still be socially pernicious.” Some point out that only the wealthy could likely take advantage of gene enrichment. As potential agents for DNA alteration in genetic engineering efforts, human-implantable microchips may therefore play a significant role in issues relating to sociological, economic, and ethnic conflict.

(b) Secret Human Experimentation

In addition, the U.S. government has an unfortunate history of conducting such initiatives as COINTELPRO, Operation Mockingbird, Psy-Ops, and other covert programs of harassment and experimentation involving mind and sensory control of unwitting subjects including prisoners, students, military personnel, and the poor. The infamous Tuskegee experiments and Cincinnati human radiation experiments are only two additional examples of the ongoing government assault of disadvantaged groups under the guise of military experimentation. Such experiments have been ostensibly intended to assist the military in researching effective methods of warfare against foreign agencies. However, the Rockefeller Commission and Church Committee revealed that one main purpose for the

development of psychological, pharmaceutical and radiological technologies was in fact to target, harass, and destroy “politically disruptive” citizens.

Many such individuals claim to have been subjected to electronic harassment or harassment via the use of directed energy. Some suspect that they are subjects of nonconsensual human experimentation in mind control; a number claim to have evidence that they have been surreptitiously implanted with microchips that monitor their movements and thoughts, and bombard them with electronic signals causing excruciating pain; sleep deprivation; induced physical, auditory, and visual phenomena; and tumors.

Such scenarios are, regrettably, not limited to science fiction. In the 1950s the CIA began working to identify ways to influence human cognition and behavior. Often referring to such projects as “Information Warfare” and “Non-Lethal Weapons,” the government has developed secret projects to influence thought and emotion, and to inflict physical pain with the use of magnetic fields. Recently the government publicly acknowledged that it has, indeed, been experimenting with directed energy warfare.

Rapid advances now allow scientists to both see and hear the visual and verbal thoughts of humans connected to computer systems. In 2008 media sources announced that scientists can now accurately display experimental subjects’ dreams and other mental images on computer monitors. Ambient Corporation showcased a new “thought-reading” consumer device that picks up high-frequency signals sent to a user's vocal cords, and digitally “voices” the user's thoughts, without the user physically saying a word. In 1996 it was reported that scientists at British Telecom's Martlesham Heath Laboratories were developing an implantable computer chip that could record all thoughts, as well as all visual

and physical sensations.

Researchers have long labored to control the minds of human subjects via machines. A 1961 CIA memorandum stated that its objective in conducting “remote control” experimentation on animals was to devise systems for human application. The U.S. Air Force, the Office of Naval Intelligence, and Yale University funded research and experiments by Dr. Jose Delgado, who in 1974 testified before Congress:

We need a program of psychosurgery for political control of our society. The purpose is physical control of the mind. Everyone who deviates from the given norm can be surgically mutilated ... We must electrically control the brain.

Controversial doctor Rauni-Leena Luukanen-Kilde elaborated on the purported use of microchips in government experiments relating to synthetic consciousness, noting an additional downside to such use of microchips:

Implanted human beings can be followed anywhere. Their brain functions can be remotely monitored by supercomputers and even altered through the changing of frequencies ... Guinea pigs in secret experiments have included prisoners, soldiers, mental patients, handicapped children, deaf and blind people, homosexuals, single women, the elderly, school children, and any group of people considered “marginal” by the elite experimenters.

III. Applicable Law

A. Nuremberg Code

Some current uses of microchip implantation may violate international standards and principles of human rights, particularly those pertaining to human subject

experimentation.

Provision one of the Nuremberg Code unequivocally mandates that voluntary consent of human subjects is absolutely essential. This clause specifies that subjects must have legal capacity to give their consent; must not be coerced; and should know enough about the procedure to make an informed decision as to whether or not to undergo it. Current practice in human microchipping violates each of these standards. Glaring examples include the use of the technology as applied to children, the mentally ill, and others who do not have legal capacity to give their informed consent. VeriChip Corp. promoted its product's potential benefits as to mentally ill patients or others who might "wander." However, the company's recent testing on 200 Alzheimer's patients arguably violated the Code, since such patients may not have the capacity to consent. Further, if even half of the claims relating to the use of microchip implants for covert government experimentation are accurate, then the government is committing acts in serious violation of the Nuremberg Code. Finally, experimental microchipping technology is still so new that, arguably, subjects cannot reasonably know enough about the consequences to make an informed choice to undergo the procedure.

According to the second and third provisions of the Code, any human experiment must not be arbitrary or unnecessary, and should benefit society in ways that could not be achieved through other methods; results of the experiment should foreseeably justify performance of the experiment. It is not clear, however, that microchipping greatly benefits society in any way that could not be achieved by other means. Moreover, if used to target or monitor political or social adversaries, then the procedure is arbitrary at best.

The Code's next four clauses prohibit human experimentation that could reasonably result in death, serious injury, or unnecessary suffering, and dictate that an experiment's humanitarian benefits outweigh its potential risks. Newly-discovered perils attendant to microchipping, including the risks of cancer, gene therapy death, and other as-yet-unknown consequences, again cause chipping to fall short of human rights mandates. Since human microchips were rushed onto the market only five years after being patented, they have not been tested long enough to accurately reveal the associated risks. In all but the most serious cases, microchipping also fails the tests demanding weighing of harms and avoidance of the risk of injury or death; in all but terminal cases, it is unlikely that any perceived benefits greatly outweigh microchipping's dangers of cancer or death from gene therapy. Even when informed consent is given, microchip implantation may still violate the Nuremberg Code in experimental settings, because the benefits of implantation may not merit the assumption of known risks.

Finally, the Nuremberg Code states that both a subject and the presiding scientist must be free to terminate the experiment once it appears to have become untenable or harmful. However, in all cases, microchipping is difficult to end; and in cases of uninformed or inadequate consent, such termination may be nearly impossible.

B. Domestic Law on Human Experimentation

Title 10 of the United States Code confirms the requirement of informed consent prior to conducting human subject research. Under this statute, with limited exceptions, the military may only conduct human experimentation after obtaining such consent from a subject.

American courts have upheld the recognized prohibition on coerced or unconsented human experimentation and research. Prevailing U.S. case law regards a medical intrusion unaccompanied by a patient's informed consent as battery and criminal assault. In *Schloendorff v. Society of New York Hospitals*, New York's highest court averred: "Every human being of adult years or sound mind has a right to determine what shall be done with his own body..." The U.S. Supreme Court appeared to concur with this opinion in *United States v. Stanley*, where the Court maintained that "[n]o judicially crafted rule should insulate from liability the involuntary and unknowing human experimentation alleged to have occurred ..."

1. Judicial Treatment of Human Microchipping

(a) Federal Courts

The narrative of unknowing implantee Brian Wronge is by no means unique. In a more recent case, *Marino v. Gammel*, a federal court made a preliminary finding that the plaintiff may indeed have been implanted with a microchip without his knowledge or consent; however, the result was inconclusive because the plaintiff's claim could not be proven one way or another. More recently, plaintiffs suspecting that they had been covertly implanted with microchips and subjected to electronic warfare claimed that police officers refused to act on their case after informing plaintiffs that the military was involved. Once again, with no way to either prove or disprove plaintiffs' claims, the litigants were left without any legal recourse to address the matter.

(b) The Supreme Court

During Chief Justice John Roberts's Supreme Court confirmation hearings, Senator

Joseph Biden warned Roberts about the issue of implanting microchips to track humans, admonishing him, "You will rule on that — mark my words — before your tenure is over."

Some wonder whether the 2008 *Riegel v. Medtronic Inc.* decision protecting medical implant manufacturers signals the way that the Court will lean on this issue. The Bush administration won a victory in this recent case holding that manufacturers of medical implants are immune from personal injury liability, if the FDA approved the implants before they were marketed and if implants meet FDA specifications. The majority, 8-1 *Riegel* opinion argued that allowing state juries to impose liability on manufacturers of approved devices "disrupts the federal scheme."

2. State legislatures

Some states have begun to rebel against RFID and microchip technology. In 2004 Utah's House of Representatives passed the first RFID-privacy consumer protection bill. Legislators in several states voted in 2004 to prevent retailers from using RFID tags to infringe on consumer privacy. Responding to controversy over RFID tagging of schoolchildren, California later passed SB 682, which restricts government use of RFID. The bill provides for a three-year moratorium on certain government-distributed RFID cards, criminalizes the intentional interception of RFID signals without a target's knowledge, and establishes encryption standards.

In 2006, Wisconsin Governor Jim Doyle went further and signed a law criminalizing the implantation of RFID microchips into humans without their consent. Introduced as Assembly Bill 290 and passed unanimously by both houses of the Wisconsin state legislature, the law subjects a violator to a fine of up to \$10,000 per day. California

Governor Arnold Schwarzenegger has also signed SB 362, a bill illegalizing employers' forced chipping of employees as a condition of receiving pay or benefits. This civil legislation outlaws the "requiring, coercing, or compelling any other individual to undergo the subcutaneous implanting of an identification device." North Dakota, Colorado, Oklahoma, Florida, Georgia, and Ohio have introduced similar bills.

IV. Conventional Paradigms for Analysis

Human microchipping has the potential for profound impact upon culture, industry, and the lives of individuals – and carries attendant social, genetic, and medical risks. Having almost completely ignored the issue to date, the federal government at present provides inadequate protection for persons who accept, refuse, or are coerced to receive microchip implants. It is therefore imperative that all branches of government act now to implement effective policies. Failure or refusal to do so could result in a human rights disaster with the potential to damage both the government's credibility and the health and well-being of its citizens.

Many legal concerns accompany the new technology. Most problems potentially arise in scenarios in which humans are implanted with microchips without prior knowledge or consent to the procedure, either for covert experimentation or for other purposes; nonetheless, difficulties may also arise even when some form of consent exists. Touching on only a few of the many legal issues related to human microchipping, this section examines the most common analyses.

A. The Medical Model

Under the medical model, it is a patient's physician who ultimately makes the life-

altering decision as to whether or not an individual is implanted with a microchip, voluntarily or otherwise. According to this model, the medical profession would set the standards for making the decision and directing the course and aftermath of the procedure.

However, this model is unsatisfactory. A physician's own personal biases or financial self-interest may impermissibly influence the decision. A physician could, for instance, (1) fail to tell the patient that he or she has been selected to receive a microchip, and could simply inject it under false pretext; (2) fail to inform the patient as to the serious possible health risks, including cancer and genetic alteration; or (3) pressure arguably incompetent persons, children, or their guardians in an attempt to coerce implantation of microchips.

Additionally, because the technology is so new – and still experimental – physicians do not know its possible consequences or effectiveness. There is a lack of sufficient statistical data. Residual effects may not even become known until decades from now, which would strip patients of the ability to file malpractice lawsuits. As to the near future, judicial remedies are inadequate, since there is currently no judicial precedent or federal legislation on point.

Moreover, the demographic makeup of the medical profession indicates that many physicians may be insensitive to, or unjustifiably suspicious of, racial minorities, women, the poor, and other disadvantaged groups. Such cultural baggage may cause physicians to urge or coerce microchip implantation when such implantation is unjustified or unnecessary.

The medical model does not appear to be compatible with the issue of human

microchipping, which carries profound implications for a person's social status, privacy, physical well-being, and more. It does not provide an implantee with adequate information, and carries significant danger of arbitrariness in its application.

B. The Public Health Model

Generally, public health law attempts to forestall widespread danger to the mass public by undertaking to contain and eradicate disease, primarily through the use of prevention.

Actions under the public health model may include financing certain health care agendas, direct interventions, and education. The public health model could conduct information campaigns to encourage microchip implantation for target groups; offer free or low-cost implantation to low-income groups; or mandate the implantation of all "at-risk" patients.

VeriChip and other proponents of human microchipping have placed most emphasis on the public health model as a rationale for mass microchip implantation – probably because this is the area in which there is arguably the least controversy and the greatest potential benefit. Some have even ventured to recommend the mandatory microchip implantation of all persons.

However, the case for microchip implantation under the public health model is flimsy at best. The mere existence of mental illnesses and such diseases as diabetes does not constitute a public health threat. Moreover, this justification does not explain the professed urgency for chipping healthy children. Even if the government could argue a compelling interest in monitoring Americans' health, mandatory microchip implantation

would not satisfactorily promote that interest.

Nor does the public health model serve to adequately educate people regarding genetic illnesses such as diabetes and Alzheimer's. The microchipping campaign has focused on implantation of people suffering from such genetic diseases; but increased microchipping will not cause implantees to change their behavior in healthy ways, because their maladies are genetic and cannot be prevented.

Again, since there are no guidelines as to determining who should receive a microchip implant, a public health model seems inappropriate. If the public health model were implemented, however, it would be critical for the health care system to establish guidelines for implantation and ensuring the existence of legally-valid informed consent.

V. Solutions for Implementation

A. Human Rights Model

A human rights model would give greater consideration to people's decisions as to whether or not to receive a microchip implant. This would potentially provide greater quality assurance for implantees. A human rights model could also help to guarantee fundamental rights – guarantees that are lacking under other models.

It should also conform to the guidelines set forth in the Nuremberg Codes and other international human-rights legislation. Informed consent would be critical, and any implantee choosing to be microchipped would have control over the process, progress, application, and duration of the implantation. This is particularly significant in light of the fact that the vaunted medical benefits of microchip implantation remain largely unproven while, conversely, documented physiological and social risks abound.

The issue of informed consent for arguably incompetent individuals would likely remain contentious. Both the United States and the international community must therefore begin engaging now in dialogue to establish acceptable and appropriate guidelines.

Implantees and those who suspect coerced implantation would require a legal system based on legislative procedures for investigating complaints and potential abuses. Implementing such a system would mandate extensive deliberation as to the guidelines for establishing voluntariness and enabling implantees to obtain information about and ensure the quality of the process. So as to provide courts with a uniform set of guidelines, the federal legislature must become involved.

Informed Consent Under the Human Rights Model

There is arguably no justification for requiring a person to receive a microchip implant. A human rights model applied to microchip implantation would demand consent without duress or coercion.

All persons should have a legal right to refuse to receive a microchip implant. This includes children, who by proxy of their parents should be able to refuse untested technology whose benefits are as yet unproven but which has already revealed many physiological and social risks. Although some people would not object to being chipped, others might have valid personal reasons for refusal. Healthcare providers involved in a microchip implantation situation must heed the cultural and personal backgrounds of potential implantees, to ensure that implantation is not coerced.

Additional Concerns Addressed by the Human Rights Model

There are more pedestrian, but equally significant, potential social dangers related to

microchip implantation. In the event that implantable genome chips become a reality, such chips will likely reveal genetic conditions previously unknown to implantees; such revelations could adversely affect implantees' ability to obtain health insurance. Even those who manage to remain insured may face staggering costs. Insurance companies have begun charging exorbitant amounts to people predicted to be at genetic risk. After health insurer Horizon Blue Cross and Blue Shield of New Jersey recently joined with VeriChip Corp. in a pilot program to implant microchips in chronically-ill patients, some Americans started to worry that insurance companies might soon refuse to cover individuals who will not "take the chip."

Others are concerned that refusing to submit to microchip implantation may cost them their jobs. In light of the mandated microchipping of government and private-sector employees, this is not unrealistic. Some Americans have been fired for refusing to submit to genetic testing.

Microchipping also presents moral and religious quandaries for a number of people. Still others harbor concerns about personal privacy and self-determination. Additionally, permitting coercion in regard to microchip implantation could potentially lead to conflicts of interest between patients and their physicians – particularly if physicians are receiving funding to perform the procedure, or are being pressured by government actors to microchip patients.

Although chipping is, undoubtedly, a valid option in many scenarios, the information collected from an implanted microchip should not be used for purposes other than those to which the patient has expressly consented. Any unauthorized use could

provide a precipitous push down the slippery slope of past government abuses, stalking, or other unacceptable scenarios. Such applications could lead, as a consequence, to discrimination and social stigma for implantees.

Information Provided to Individuals Under the Human Rights Model

A human rights model should guarantee personal control over an implantee's medical information. Potential recipients of microchip implants need to receive details about the known risks and benefits, and the potential impact on the person's life, in both psychological and empirical terms. Healthcare providers should not neglect to inform their patients as to what kind of information is being stored and accessed via implanted microchips. For reasons of personal security, patients must also be informed as to where, how, and how often the information is being stored and accessed; who is accessing the information; and what security measures are in place to prevent unauthorized access to the information. Potential implantees are also entitled to receive information as to how to reverse the implantation, if desired.

Quality Assurance Under the Human Rights Model

The human rights model would provide greater emphasis on quality assurance. Our current regime provides inadequate safeguards to ensure that implantation is necessary, desirable, or helpful in any way that could not be accomplished by less invasive means. At present there are also inadequate provisions for monitoring and removal of microchips.

To attain quality assurance, before any large-scale implementation, the practice of human microchipping should undergo a more extensive research period, with years of clinical studies that provide more data as to the potential risks and benefits. Healthcare

providers performing implantation should also be required to fulfill certain obligations, obtain a specific license, and meet training standards. Moreover, such professionals should be obliged to adhere to stringent guidelines indicating under what specific circumstances chipping could become an option. As testing goes forward, all implementation facilities must collect data involving the risks; side effects; nature of resulting cancers; and social, psychological and physiological impact of microchip implantation.

Added incentive could come in the form of reimbursement for tests to those labs on published lists that show the lab has met satisfactory performance standards.

Increased commercialization of the healthcare industry and growing national security pressures demand implementation of mechanisms that will protect individuals from pressure from political and market forces. A human rights model for human microchipping would both allow people to refuse microchip implantation and protect those who opt to undergo the procedure. It would also demand adherence to the doctrine of informed consent and other provisions of human rights law; allow individuals to choose whether or not to be chipped; scrutinize and control third-party access to, and use of, information obtained and stored; and help to ensure the maintenance of certain standards in implementation.

B. Recommendations for Implementation

1. Presidential Task Force

Considering the present and potential future magnitude of the human microchipping experiment, arguably the most effective solution would be for President Obama to issue an

executive order establishing a presidential task force dedicated to review of the issue of human microchipping. This task force should investigate both claims of coerced chipping and the general issue of human microchipping, to make sure that the procedure complies with a human rights agenda and to consider its long-term implications for humanity. Such a proposal may at first seem out of proportion in addressing this emerging issue. However, considering the alleged past human rights abuses of this new field of science, as well as its immense future potential to revolutionize critical fields from genetic engineering to surveillance technology, the versatile tool of human microchipping could well touch many aspects of our daily lives. Additionally, the fact that the U.S. Vice-President warned the U.S. Supreme Court's Chief Justice about the impending urgency of adjudication on the issue should suffice to convince skeptics that even the highest levels of government recognize the importance of the matter.

Ideally, a task force established by the President would be a multi-agency entity comprised of cabinet-level and other members representing federal departments, agencies, and commissions. A White House imprimatur upon this project would be significant; for this reason, the task force would best be headed by the National Security Council or another executive branch that can confer a great level of authority. In the interest of promoting "checks and balances" to such a sensitive issue, members of the task force should originate from all three branches of government. Executive Branch members could hail from the Department of Justice (including the Civil Rights Division), State Department, National Security Council, Department of Defense, Department of Health and Human Services, and the Department of Education. The task force should also include

representatives from the U.S. Commission on Civil Rights.

An effective use of this non-partisan body would be in employing its authority so as to conduct investigations and hearings into the issue of human microchipping. It should be tasked with the responsibility of conducting inquiries into specific allegations of coerced or inadequately informed chipping. If it found that coercion had indeed occurred, the commission would have responsibility for determining which agency or agencies had been involved in the practice. If the commission found that no coerced chipping had occurred, it should nonetheless establish guidelines for prevention of such an eventuality, and for protecting implantees per the demands of the Nuremberg Code and other human rights provisions.

Any such presidential task force must additionally have the authority to issue opinions, proposals, and reports regarding current and potential practices and legislation relating to human microchipping. Furthermore, it should recommend ongoing monitoring and training measures.

Yet another responsibility delegated to the commission would be the issuance of reports for all three branches of government, and addressing appropriate federal legislation in detail. In regard to the executive branch, the task force should devise guidelines for oversight and internal review procedures, to make sure that agencies do not infringe on human rights in the name of national security or other official concerns. It is equally critical to establish a standard of judicial discretion as to determining whether or not claims of coerced microchipping are indeed “frivolous.” Such a decision should not be left entirely to judges. Passage of a federal statute containing grievance procedures for potential plaintiffs

would reduce judicial discretion, provide courts with guidance, and allay judges' fears about non-justiciability of this hot-button topic. The task force must also issue guidelines for creation of a government body that could provide continued monitoring of the issue after Congress has passed an appropriate federal statute.

If the President does not establish a task force endowed with investigatory powers, then he would be well-advised, at a minimum, to establish a commission that could advise Congress, a special prosecutor, or other entities to conduct their own investigations into the matter. In the alternative, he could assign a specific agency to the task; however, this is not ideal, as such unilateral authority could lead to reduced transparency, monopolization, and other undesirable results.

2. Federal Legislation

Whether or not the President creates an independent commission on human microchipping, it is imperative that Congress enact federal legislation specifically addressing the issue. In the interest of consistency, Congress would also do well to examine the applicability of human microchipping to the Federal Torture Statute, which it passed in 1994 to prohibit torture committed by U.S. officials.

The new federal statute should include a mandate for the creation of a permanent inter-agency commission that would survive political transitions. Such a commission's independence would ideally be guaranteed by an impartial appointment procedure, with its members nominated by the President. Possessing both implementation and monitoring capabilities, this body could hold hearings, review specific complaints for validity, and use any information gleaned thereby to continually improve and supplement federal policy.

This commission should adopt preventive, investigative, and punitive measures in addressing human microchipping and related concerns.

Punitive measures would include specification as to judicial or other remedies to investigate and punish violators of the federal statute's mandate, and to ensure that victims receive compensation. In addition, President Obama has a duty to appoint judges who have evidenced respect for human rights; and he must support judicial human rights education and the role of courts in airing allegations of human microchipping. It is critical that the new administration protect victims' rights of due process and access to the courts.

It is time for the federal government to break its silence on the issue, and educate state and local government officials and the public regarding human rights implications attendant to human microchipping. Continued outreach would help to reduce the occurrence of violations and ambiguities beyond the direct purview of the federal government. A federal commission should involve state and municipal human rights groups in this endeavor, and could even support such organizations by providing grants in response to state and local proposals. Just as important, the federal commission should assist state and local governments, schools, and other relevant entities in formulating education, training, and public awareness programs. State and local officials must receive training on statutory requirements surrounding human microchipping.

3. Treaties

A long-term commission created by an act of Congress must also have the power to ensure that microchipping conforms to standards set forth in human rights treaties. In addition to the Nuremberg Code, there exist numerous international treaties that address

human rights; compliance with such treaties could provide added weight to efforts to bring microchipping into compliance with human rights concerns. However, prior administrations have either failed to ratify some of these treaties or claimed that they are non-self-executing. The new Obama administration should support ratification and implementation of applicable treaties, including the American Convention on Human Rights; International Covenant on Civil and Political Rights (ICCPR); and the Optional Protocol to the Convention against Torture. Additionally, if doctors have indeed targeted single women, minorities, and other marginal groups for microchipping, the new administration should support the Race Convention; Convention on the Elimination of Discrimination Against Women (CEDAW); Convention on the Rights of the Child; Convention on the Rights of Persons with Disabilities; and International Covenant on Economic, Social and Cultural Rights. Considering that VeriChip recommended the chipping of immigrants and guest workers, the administration also has a responsibility to support the International Convention on the Protection of the Rights of All Migrant Workers and Members of their Families.

In addition to domestic efforts, the new administration has a responsibility to engage immediately with international bodies such as the United Nations to establish guidelines on the issue of human microchipping. Since the topic has many potential areas of overlap, including torture, medical experimentation, and genocide, a new federal commission must become involved to join with the global community in discussion and regulation of human microchipping and other forms of medical and genetic alteration.

Boston University's Health Law Department chair George Annas and Chicago-Kent

College of Law professor Lori Andrews have called for a global treaty banning “species-altering” applications of human genetic engineering. The 1997 Convention on Biomedicine and Human Rights, signed by 34 European countries, prohibits inheritable genetic modification for enhancement purposes. Japan, Brazil, South Africa, and Canada have adopted similar policies. Unlike these and other nations, the U.S. has yet to ban human genetic engineering. Moreover, it has completely failed to adequately raise the closely-related issue of human microchipping.

Most proponents of human microchipping tend to argue for the procedure in terms of public health and medical concerns. However, as we have seen, such arguments are inadequate to address the issue. There exists no public health crisis that would justify mass implementation of such a drastic corporal intrusion; and few other than the severely or terminally ill would likely stand to benefit significantly from receiving microchip implants.

Those of a more scientific bent might observe that, considering this new technology’s vast potential, human microchipping should continue, for the sake of scientific knowledge. There can be little question that continuing the experiment in human microchipping may well yield potentially valuable information. It is nonetheless critical to emphasize the fact that the technology is still strictly experimental, as well as empirically hazardous, and should be treated as such. Therefore, any future application of human-implanted microchips should be conducted in strict compliance with the applicable provisions of the Nuremberg Code; and, again, all uninformed instances of human microchipping should be banned outright.

Still others have, if quietly, urged human microchipping for enhancement of law enforcement or national security applications. But the above discussion of past and potential political abuse by government agents should persuade many that unthinkingly embracing chip implantation for such purposes may be unwise. Additionally, any political motives in the use of human microchipping would likely qualify as arbitrary use of human subjects, in contravention with the Nuremberg Code.

A more powerful argument against federal intervention in human microchipping could be that, since law enforcement is delegated in part to states and municipalities, federal involvement might amount to commandeering or usurpation of state sovereignty. Nonetheless, history has given us many examples (such as civil rights legislation) in which certain concerns were so compelling as to mandate a uniform national approach specified and monitored by the federal government. As this Note has shown, human microchipping qualifies as such an issue.

VI. Conclusion

The above discussion may convince us that the coerced or uninformed implantation of microchips into humans should be universally banned. Even authorized microchipping, which may significantly benefit certain elderly or infirm, carries biological and social risks, and should be implemented only with caution as the scientific community conducts more extensive testing. Among the possible paradigms for analyzing such implementation, a human-rights-centered model best provides for concerns about informed consent, quality control, and issues of personal dignity and privacy.

It is time for all three branches of government to directly address the issues relating to

human microchipping, including oversight of government use; appropriate safeguards; and the investigation and prevention of abuses, accompanied by criminal penalties for perpetrators. The federal government must adopt a human-rights-centered approach in its review, particularly in regard to underprivileged and captive classes.

Finally, it is imperative for the United States to join the international community in examining the ramifications of microchips, from personal privacy to DNA alteration.

American bioethicists need to address these issues on a global scale, and to create enforceable guidelines that will assist in averting abuses and drastic, unintended consequences. We must act now to chart a responsible future course.

In the words of Richard Hayes:

We will need regulations, laws and treaties at domestic and international levels that preclude dangerous applications of the new human biotechnologies in order that the many benign and beneficent applications can be developed in good faith and full confidence. It is difficult to imagine a greater or more urgent challenge.

Matifa Angaza, "Charge of Holocaust: Medical Experiment on Black Inmate," THE CITY SUN NEWSPAPER, Dec. 15, 1993; <http://www.raven1.net/wronge2.htm>; Roger Hutcheon, "Implant Victim Refused Help by 'Humanitarian' Physicians," THE CITY SUN NEWSPAPER, available at <http://www.raven1.net/wronge1.htm>; <http://www.afafa.org/>. Reports state that miniature "radios" were implanted in the membranes of Wronge's eardrums. One of the doctors who examined Wronge informed THE CITY SUN NEWSPAPER that a chip implanted on Wronge's trachea could receive and transmit sound, including the high-pitched frequencies of his thoughts that resonated on his voice box.

Id. [Note to Editor: My research indicates that Wronge sued New York State in a federal case over which Judge Reena Raggi (E.D.N.Y.) presided. However, the case appears to be unpublished. I can try to track down the court filing information, or (ideally) the actual court papers.]

Id.

Id.

See, e.g., Barnaby J. Feder, "Report of Cancer Hurts Maker of Chip Implants," THE NEW YORK TIMES, Sept. 11, 2007; Siobhan Morrissey, "Are Microchip Tags Safe?", TIME, Oct. 18, 2007, <http://www.verichipcorp.com/news/1192716360>; Todd Lewan, "Chip Implants Linked

to Animal Tumors," WASHINGTON POST/The Associated Press, Sept. 9, 2007.

VeriChip Corp. was reportedly purchased by a Canadian company.

See, e.g., Elaine M. Ramesh, *Time Enough? Consequences of Human Microchip Implantation*, 8 RISK: HEALTH SAFETY & ENV'T 373 (Fall, 1997); Justin M. Schmidt, Note And Comment: *RFID and Privacy: Living In Perfect Harmony*, 34 RUTGERS COMPUTER & TECH. L.J. 247 (2007); Oleg Kobelev, *Big Brother on a Tiny Chip: Ushering in the Age of Global Surveillance Through the Use of Radio Frequency Identification Technology and the Need for Legislative Response*, 6 N.C. J. L. & TECH. 325 (Spring 2005).

Id.

The states of California, Wisconsin, North Dakota, Colorado, Oklahoma, Florida, Georgia, and Ohio have all passed or introduced legislation banning coerced human microchipping.

See, e.g., the Nuremberg Code, Reprinted from Trials of War Criminals before the Nuremberg Military Tribunals under Control Council Law No. 10, Vol. 2, pp. 181-182. Washington, D.C.: U.S. Government Printing Office, 1949; the Declaration of Helsinki; 10 U.S.C. 980 (dictating that the military may only conduct human experimentation after obtaining informed consent from experimental subject(s)).

Supra note 12.

Id. at cl. 1.

For example, in 2007 hundreds of Alzheimer's patients were implanted at a Florida facility, as part of a pilot program by VeriChip, the former leading manufacturer of human microchips. See Morrissey, *supra* note 5.

See, e.g., In Re Cincinnati Radiation Litigation, 874 F. Supp. 796 (S.D. Ohio 1995); Barrett v. United States, 798 F.2d 565 (2d Cir. 1986); Orlikow v. United States, 682 F.Supp. 77 (D.D.C. 1988); Bivens v. Six Unknown Named Agents of Bureau of Narcotics, 403 U.S. 388 (1971).

See, e.g., the case of Brian Wronge, *supra* notes 1-4; Marino v. Gammel, 191 F. Supp.2d 243 (D.C. Mass. 2002).

Id.

See note 9, *supra*.

See discussion of "biochips," DNA chips, DNA/RFID chips, and related technology, Section II.B.

See, e.g., Associated Press, "Dreams May No Longer Be Secret with Japan Computer Screen," Dec. 11, 2008. In 1981 the Department of Defense requested the FBI file of inventor Nikola Tesla, in regard to the latter's experiments aimed at reading the images on a sleeping person's retina. The agency stated that Tesla's "basic principles [were] of considerable value to certain ongoing research within the DoD." Peter Phillips, Lew Brown & Bridget Thornton, "US Electromagnetic Weapons and Human Rights," <http://www.projectcensored.org/newsflash/ElectromagneticWeapons.pdf>; see Tesla's FBI files at the FBI FOIA site located at <http://foia.fbi.gov/foiaindex/tesla.htm>. See also "Stereotaxic Implantation of Electrodes in the Human Brain: A Method for Long-Term Study and Treatment," Heath, John, Fontana, Department of Psychiatry and Neurology, Tulane University School of Medicine; Dr. David Whitehouse, "Looking Through Cats' Eyes," BBC NEWS, 11 Oct. 1999, <http://news.bbc.co.uk/2/hi/science/nature/471786.stm>.

See VeriChip Corp.'s arguments in Section II.2.B of this Note.

See relevant discussion in Section II.B.

See relevant discussion in section II.C.1.

See relevant discussion in section II.C.2.

See note 9, *supra*.

A brief LexisNexis or Westlaw search for cases claiming covert microchip implantation will amply illustrate this point.

Morrissey, *supra* note 5; Lewan, *supra* note 5; Alorie Gilbert, "Big Brother: FDA Approves Injecting ID Chips in Patients," Global Research, Nov. 19, 2005.

See note 25, *supra*.

The major consumer application of GPS is to track the locations of persons and/or objects.

See, e.g., Richard Stenger, "Tiny Human-Borne Monitoring Device Sparks Privacy Fears," CNN.COM, December 20, 1999.

Will Weissert, "Microchips Implanted in Mexican Officials," Associated Press/MSNBC, July 14, 2004.

Sherrie Gossett, "SEC Investigating Applied Digital," WORLD NEWS DAILY, Apr. 8, 2003.

Radio-frequency identification (RFID) is a method of electronic identification. RFID tags, embedded in objects or living organisms, use radio waves to receive and transmit signals for the purpose of tracking and identification. First patented in 1983, RFID technology is now widely used in settings ranging from toll roads to retail stores. It also underlies the basic technology used in implantable microchips.

Richard Stenger, "Tiny Human-Borne Monitoring Device Sparks Privacy Fears," CNN.COM, December 20, 1999.

"FDA Approves Computer Chip for Humans," The Associated Press/MSNBC, Oct. 13, 2004;

Alorie Gilbert, "Big Brother: FDA Approves Injecting ID Chips in Patients," GLOBAL RESEARCH, Nov. 19, 2005; Morrissey, *supra* note 5.

Barnaby J. Feder, "Report of Cancer Hurts Maker of Chip Implants," THE NEW YORK TIMES, Sept. 11, 2007.

David E. Gumpert, "Animal Tags for People?," BUSINESS WEEK, Jan. 11, 2007.

Morrissey, *supra* note 5.

Gumpert, *supra* note 8.

Kenneth R. Foster & Jan Jaeger, "RFID Inside," IEEE SPECTRUM Online, <http://www.spectrum.ieee.org/print/4939>.

Independent studies have shown that microchip signals can be cloned and hacked by others; once cloned, the microchip signals are no longer unique.

Weissert, *supra* note 3.

Sherrie Gossett, "Bio-chip Featured at Government Health Showcase," WORLD NET DAILY, April 29, 2004; Sherrie Gossett, "SEC Investigating Applied Digital," WORLD NET DAILY, April 8, 2003. Alternatively, the chip can directly store such information internally. *Id.*

Murray, *supra* note 2; "FDA Approves Computer Chip for Humans," The Associated Press/MSNBC, Oct. 13, 2004.

Murray, *supra* note 2; <http://www.thestar.com/sciencetech/article/136744>.

In 2002, Applied Digital microchipped eight individuals as part of a marketing campaign. Sherrie Gossett, "Your Papers, Please...Miami Journalist Gets Chipped," WORLD NET DAILY, Apr. 29, 2003. Kevin Warwick, Professor of Cybernetics England's Reading University, has conducted extensive experiments into the potentials of human microchipping. In 1998, Warwick implanted a microchip into the nerves of his left arm, so as to link his nervous system to a computer. After then injecting a microchip into his wife, Warwick (a strong proponent of microchipping) successfully experimented with "the first purely electronic communication experiment between the nervous systems of two humans." <http://www.kevinwarwick.com>. A number of people have already been implanted with microchips that trigger sensors to automatically open doors and turn on lights.

<http://www.thestar.com/sciencetech/article/136744>; Robyn Curnow, "The Price to Pay for VIP Status," CNN, Oct. 6, 2004.

Id.

Morrissey, *supra* note 5; Todd Lewan, "Chip Implants Linked to Animal Tumors," WASHINGTON POST/The Associated Press, Sept. 9, 2007. Applied Digital Solutions also emphasized the VeriChip's possible uses on implantable pacemakers, defibrillators, and artificial joints. Murray, *supra* note 2.

Gumpert, *supra* note 8.

Gossett, *supra* note 13. Applied Digital also emphasized its product's efficiency potentials (including shared medical records and more accurate medical dosages), and touted the microchip's cost-saving benefits in medical applications. *Id.*

Jonathan Carr-Brown, "Patients Get 999 Chip Implants," TIMES Online, June 12, 2005. In 2007 the U.S. Patent and Trademark office filed Kodak's application to patent an edible,

digestible RFID tag intended to monitor "the ingestion of medicines." U.S. Patent and Trademark Office; Barry Fox, "Invention: Edible RFID," NEW SCIENTIST, Feb. 12, 2007; Adi Tedjasaputra, "Digestible RFID Tag: An Alternative for Your Internal Body Monitoring," RFID ASIA, Feb. 15, 2007. Some have pointed out the possibility of law enforcement and counterterrorism officials tagging the food of suspected criminals or terrorists. "RFID Gets Smaller and Edible...and Bigger," Feb. 15, 2007, <http://future.iftf.org/rfid/index.html>.

Sherrie Gossett, "Bio-chip Implant Arrives for Cashless Transactions," WORLDNETDAILY.COM, Nov. 21, 2003. Applied Digital Solutions promoted its VeriChip as another step toward a "cashless society," a payment method that could substitute cash and credit-card transactions. *Id.*

Murray, *supra* note 2.

To this end, Applied Digital created proprietary portal readers to scan implantees' microchips as they entered and exited rooms. Gossett, *supra* note 29. CEO Scott Silverman suggested that implanted microchips could be used to track the movements of nuclear plant employees, and might prove useful in other security applications. Incidentally, Israel's Secret Service is said to have implanted some of its agents with GPS technology. Gossett, *supra* note 13.

"Implanted Chips in Our Troops?," Newsmax.com, Aug. 21, 2006; "Digital Dog Tag Already Cloned," EXAMINER.COM, Aug. 22, 2006, http://www.examiner.com/a-234701~Digital_dog_tag_already_cloned.html.

Cincinnati-based security and surveillance company (and government contractor) CityWatcher.com sparked controversy when it began requiring its employees to receive microchip implants in order to access a secure area. The Associated Press/CNN, "Microchips in Humans: High-Tech Helpers or Big Brother Surveillance?," CNN.COM, Aug. 1, 2007. Mexico's Attorney General, Rafael Macedo, and members of his staff were chipped as a condition of gaining access to restricted areas. Weissert, *supra* note 3; Thomas C. Greene, "Anti-RFID Outfit Deflates Mexican VeriChip Hype," THE REGISTER, Nov. 30, 2004.

Morrissey, *supra* note 5; Lewan, *supra* note 24. In Mexico, more than 1,000 patients had been implanted with VeriChip by the year 2005. Gilbert, *supra* note 6.

Lewan, *supra* note 24.

In 2003, Buffalo, New York's Enterprise Charter School launched an RFID test program in which school students are at all times required to wear plastic identifying badges containing RFID chips that record their arrival times in a database. The school's director has enthused about the program, and has expressed plans to extend its applications to many other aspects of the students' school lives. Julia Scheeres, "Three R's: Reading, Writing, RFID," WIRED, Oct. 24, 2003. Schools in Britain, Japan, and Denmark have introduced similar programs. Jo Best, "Schoolchildren to be RFID-Chipped," Silicon.com, July 8, 2004, <http://networks.silicon.com/lans/0,39024663,39122042,00.htm>; Chris Williams, "Schoolkid Chipping Trial 'a Success,'" THE REGISTER, Oct. 22, 2007.

Erik Baard, "Coal-Mine Canaries on a Chip," WIRED, June 13, 2003.

Id.

Paul Elias, "DNA Vaccines May Offer Defense Against Flu Pandemic," USA TODAY / The Associated Press, Oct. 30, 2005.

Id.

Id. Most diseases have a genetic factor. Scientists can introduce therapeutic DNA to treat genetic conditions by using viruses. Despite much promise, however, gene therapy has still had limited results. The bionic chip provides another option. Frederick Hecht, "Gene Therapy - The Future Is Here!," <http://www.medicinenet.com/script/main/art.asp?articlekey=12662>; http://www.futuredirectns.com/english/news/bionic_chips.shtml.

"DNA Microarray (Genome Chip) — Monitoring the Genome on a Chip," Leming Shi, Ph.D., 1998-2002, <http://www.gene-chips.com/>; "DNA Biochip May Lead to Fast Genetic Screening, More Effective Drugs," SCIENCE DAILY, Oct. 29, 2001; "Biochip Technology Has a Great Future," <http://www.physorg.com/news1174.html>.

Affymetrix, Inc. owns a registered trademark, GeneChip®, for its popular microarray. *Id.*

In the words of scientist Tuan Vo-Dinh, “[t]he DNA biochip opens a new world of diagnostics based on genetics.” “DNA Biochip Provides Blood Test Answers in Minutes,” <http://www.pslgroup.com/dg/4d962.htm>; http://www.smalltimes.com/articles/article_display.cfm?Section=ARCHI&C=Bio&ARTICLE_ID=268313&p=109 - STMicroelectronics launches DNA chip - Nov. 1, 2002.

The genome chip can also currently be used for DNA verifications in crime investigations. A chemistry professor at the University of California at San Diego has experimented with ways to reduce genome chips to the size of dust particles, infuse them with medication, and inject them into patients to locate and kill cancer cells. Olga Kharif, “A Whole New World of Chips,” BUSINESS WEEK, Jan. 21, 2004.

Id.

“DNA and RFID Partnership: Advanced ID Corporation and Manakoa Security Inc. Announce a Joint Marketing and Technology Integration Agreement on DNA and RFID,” Oct. 4, 2006, <http://www.rfidsolutionsonline.com/content/news/article.asp?DocID=%7BC28BF3DF-087F-4673-9EA2-DCF653C68166%7D&Bucket=Current+Headlines&VNETCOOKIE=NO>.

The prior year, Applied DNA Sciences, Inc. joined forces with Advanced Coding Systems Ltd. in a similar venture. Feb. 10, 2005, *id.* Not to be outdone, Hitachi announced the development of its own combination RFID / DNA chip. “Development of World's First RFID Sensor Chip for DNA Analysis,” Feb. 10, 2005, <http://www.hitachi.com/New/cnews/050210b.html>.

Id.

Feder, *supra* note 5; Morrissey, *supra* note 5.

Id.

Morrissey, *supra* note 5.

A 2006 study also unearthed a case of cancer in a French bulldog, though it is uncertain whether or not the microchip implant was the cause.

Lewan, *supra* note 24.

VeriChip Corp. had stood by its product, insisting that it was safe. However, this assertion was undermined by the fact that, at the time of FDA approval, Tommy Thompson headed the Department of Health and Human Services, which also oversees the FDA. Two weeks after the VeriChip was approved, Thompson resigned from his Cabinet post and subsequently joined the boards of both VeriChip and Applied Digital. Thompson then received stock options on more than 250,000 shares of VeriChip and Applied Digital, as well as \$40,000 cash in both 2005 and 2006. Lewan, *supra* note 24.

The Associated Press/CNN, “Microchips in Humans: High-Tech Helpers or Big Brother Surveillance?,” CNN.COM, Aug. 1, 2007; *see, e.g.*, Curnow, *supra* note 14.

The National Institutes of Health responded to the death of 36-year-old Illinois resident Jolee Mohr as a result of an experimental study sponsored by Seattle’s Targeted Genetics Corporation. Mohr’s arthritis doctor (who received a commission for referring patients to Targeted Genetics) suggested that Mohr undergo gene therapy to alleviate her occasional joint stiffness. Otherwise apparently healthy, Mohr died after developing a high fever and multiple organ failure, subsequent to being injected with the genes of engineered viruses. In 2007 the incident was under investigation by the Food and Drug Administration, which has regulatory authority for gene therapy. Marcy Darnovsky, “Gene Therapy Death Raises Ethical Issues,” SAN FRANCISCO CHRONICLE, Sept. 13, 2007.

See, e.g., Baard, *supra* note 63.

LEE SILVER, REMAKING EDEN: HOW GENETIC ENGINEERING AND CLONING WILL TRANSFORM THE HUMAN FAMILY (1998).

See, e.g., Sally Deneen, “Designer People,” E, Jan. 1, 2001, <http://www.encyclopedia.com/doc/1G1-68951943.html>.

Id.

Richard Hayes, “Self-Made Man?,” 3 THE AMERICAN INTEREST 3 (Winter 2008).

Id.

Id.

Id.

Id.

Marcy Darnovsky, "Watson's Dark Vision," PHILADELPHIA INQUIRER, Nov. 5, 2007. Watson has urged people not to let "Hitler's use of the term *Master Race*" dissuade them from seeking to use genetics to change humanity. *Id.*

Deneen, *supra* note 60.

Hayes, *supra* note 86.

See also Osagie K. Obasogie, "Racial Alchemy," NEW SCIENTIST, Aug. 18, 2007.

Hayes, *supra* note 86.

Beth Burrows, director of Seattle's Edmonds Institute, has opined, "[a]s far as I'm concerned, this thrill we have about the future will end up being one big elitist ripple." Deneen, *supra* note 60.

Peter Phillips, Lew Brown & Bridget Thornton, "US Electromagnetic Weapons and Human Rights," <http://www.projectcensored.org/newsflash/ElectromagneticWeapons.pdf>; "Me and My Shadow": A History of the FBI's Covert Operations and COINTELPRO - Part 1. Produced by Adi Gevins, Pacifica Radio. 1976. Rebroadcast by Democracy Now! Wednesday, June 5, 2002. See also Paul Wolf's website for a detailed archive of official COINTELPRO documents and transcripts of the Church Committee hearings: <http://www.icdc.com/~paulwolf/cointelpro/cointel.htm>; Project MKULTRA, The CIA's Program of Research in Behavioral Modification, August 3, 1977, US Senate, Select Committee on Intelligence, and Subcommittee on Health and Scientific Research of the Committee on Human Resources.

Phillips, Brown & Thornton, *supra* note 97; see VICTOR MARCHETTI & JOHN D. MARKS, THE CIA AND THE CULT OF INTELLIGENCE, Dell Books, 1975.

Phillips, Brown & Thornton, *supra* note 97; see WILLIAM E. DAUGHERTY & MORRIS JANOWITZ, A PSYCHOLOGICAL WARFARE CASEBOOK, Baltimore, MD: Johns Hopkins University Press, 1958. In particular, see Daugherty's article on "US Psychological Warfare Organizations in World War II," pp. 126-136.

Phillips, Brown & Thornton, *supra* note 97; Patricia Greenfield, "CIA's Behavior Caper," APA MONITOR, December 1977, pp. 1, 10-11; Thomas O'Toole, "CIA Infiltrated 17 Area Groups, Gave out LSD Suicide Revealed," WASHINGTON POST, June 11, 1975. See also the testimony of US Senator Edward Kennedy, Joint Hearing before the Select Committee on Intelligence, US Senate, 95th Congress, 1977, regarding the CIA's "extensive testing and experimentation," including the drugging of unwitting Americans.

In which numerous black males with syphilis were deliberately left untreated, ostensibly so that researchers could study the ravages of the disease on humans.

In *Re Cincinnati Radiation Litigation*, 874 F. Supp. 796 (S.D. Ohio 1995).

Phillips, Brown & Thornton, *supra* note 97; Jean Heller (Associated Press), "Syphilis Victims in the US Study Went Untreated for 40 Years," THE NEW YORK TIMES, July 26, 1972; and VN Gamble, "Under the Shadow of Tuskegee: African Americans and Health Care." AMERICAN JOURNAL OF PUBLIC HEALTH 7(1997):1773-1778; *In Re Cincinnati Radiation Litigation*, *supra* note 1.

See also Arlene Tyner, "Mind-Control Part 1: Canadian and US Survivors Seek Justice," PROBE MAGAZINE, March-April, 2000.

An article by David Hambling in NEW SCIENTIST magazine, March 2005, entitled, "Maximum Pain is Aim of New US Weapons," appears to support the claims of some contemporary, self-professed targeted individuals. Phillips, Brown & Thornton, *supra* note 68; <http://www.newscientist.com/article.ns?id=dn7077>.

See, e.g., DAVID LAWSON, TERRORIST STALKING IN AMERICA; MOBBING: EMOTIONAL ABUSE IN THE WORKPLACE; Freedom from Covert Harassment and Surveillance, freedomfchs.org; <http://www.multistalkervictims.org/>; <http://www.stopcovertwar.com>; Cheryl Welsh, "U.S. Human Rights Abuse Report," Jan. 1998, <http://www.mindjustice.org>; "Gang Stalking, an

Overview," Sept. 15, 2006, <http://educate-yourself.org/cn/gangstalkingoverview15sep06.shtml>; "Group Stalking, a Growing Menace," Aug. 25, 2006, <http://educate-yourself.org/cn/groupstalking17aug05.shtml>; Gerry Duffett, "Poisoning, Gang Stalking & Psychotronic Torture in Canada," Mar. 15, 2006, <http://educate-yourself.org/cn/gangstalkingandpsychotronicsincanada15mat06.shtml>; <http://www.gangstalking.ca/>.

Id.

Phillips, Brown & Thornton, *supra* note 97.

Id.

Id.

Id.; Directed Energy Professional Society, 2006 Directed Energy Symposium Short Courses, 30 October 2006 Albuquerque, New Mexico: <http://www.deps.org/DEPSpages/DEsymp06ShortCourse.html>. The Department of Defense has created a Directed Energy (DE) Professional Society that also includes private contractors. *Id.*

See, e.g., Associated Press, "Dreams May No Longer Be Secret with Japan Computer Screen," Dec. 11, 2008. In 1981 the Department of Defense requested the FBI file of inventor Nikola Tesla, in regard to the latter's experiments aimed at reading the images on a sleeping person's retina. The agency stated that Tesla's "basic principles [were] of considerable value to certain ongoing research within the DoD." Phillips, Brown & Thornton, *supra* note 68; see Tesla's FBI files at the FBI FOIA site located at <http://foia.fbi.gov/foiaindex/tesla.htm>. *See also* "Stereotaxic Implantation of Electrodes in the Human Brain: A Method for Long-Term Study and Treatment," Heath, John, Fontana, Department of Psychiatry and Neurology, Tulane University School of Medicine; Dr. David Whitehouse, "Looking Through Cats' Eyes," BBC NEWS, 11 Oct. 1999, <http://news.bbc.co.uk/2/hi/science/nature/471786.stm>.

"Nervetapping Headband Used for Voiceless Phone Call Demo," Jason Mick, THE DAILY TECH, Mar. 13, 2008 - <http://www.dailytech.com/article.aspx?newsid=11076>. During a demonstration at the conference, the Audeo allowed two people to carry on an entire telephone conversation this way. *Id.* This gibes with an assessment of the doctor in the case of Brian Wronge, *supra* note 1, where the doctor theorized that microchips implanted on Wronge's trachea could transmit the high-pitched frequencies of Wronge's articulated (but un verbalized) thoughts.

See Rob Fixmer, "Personal Computers: The Melding of Mind With Machine May Be the Next Phase of Evolution," Aug. 11, 1998, THE NEW YORK TIMES; *see also* CHARLES JONSCHER, WIREDLIFE: WHO ARE ARE WE IN THE DIGITAL AGE?, Anchor Books, 2000.

"Brain Implants, <http://www.mindcontrolforums.com/brainimplants.htm>.

Dr. Jose M.R. Delgado Director of Neuropsychiatry Yale University Medical School Congressional Record, No. 26, Vol. 118 February 24, 1974, <http://forums.myspace.com/t/3828562.aspx?fuseaction=forums.viewthread>.

Id.

Reprinted from Trials of War Criminals before the Nuremberg Military Tribunals under Control Council Law No. 10, Vol. 2, pp. 181-182. Washington, D.C.: U.S. Government Printing Office, 1949; *see also* Brandon Keim, "Brain Scanners Can See Your Decisions Before You Make Them," April 13, 2008.

Trials of War Criminals, *supra* note 118.

Id.

In 2003, Buffalo, New York's Enterprise Charter School launched an RFID test program in which school students are at all times required to wear plastic identifying badges containing RFID chips that record their arrival times in a database. Gary Stillman, the school's director, has enthused about the program's safety and efficiency applications, and has expressed plans to extend its applications to many other aspects of the students' school lives. Julia Scheeres, "Three R's: Reading, Writing, RFID," WIRED, Oct. 24, 2003, <http://www.wired.com/science/discoveries/news/2003/10/60898>.

See, e.g., Morrissey, *supra* note 5.

Id.

Id.

Trials of War Criminals, *supra* note 118.

One of the few possible exceptions to this criticism could encompass microchipping of severely or terminally ill patients who have little to lose from “taking the chip.”

Id.

Id.

See relevant discussion in Section II.C.1.

10 U.S.C. § 980.

Id.

211 N.Y. 125, 105 N.E. 92, 93 (1914).

Id.

483 U.S. 669 (1987).

Id. See also *Canterbury v. Spence*, 464 F.2d 772 (D.C. Cir. 1972) (informed consent required); *Orlikow v. United States*, *supra* note 16 (CIA experimentation); *In Re Cincinnati Radiation Litigation*, *supra* note 16 (unauthorized experimentation); *Barrett v. United States*, *supra* note 16 (unauthorized experimentation); *Bivens*, *supra* note 16.

See the case of Brian Wronge, in this Note's Introduction.

191 F. Supp.2d 243 (D.C. Mass. 2002).

Id.

Mecca v. United States (S.D.N.Y.)

Id.

Id.

Catherine Getches, "I Have a Chip, But It's Not on My Shoulder," WASHINGTON POST, Sept. 18, 2005; Antichips.com, "Why Advocates and Lawmakers Are Concerned About Involuntary Microchipping," <http://www.antichips.com/is-the-threat-real.htm>; "Corporations, Government to Track Your Every Move," Oct. 6, 2005, http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=46697.

128 S. Ct. 999 (2008).

Linda Greenhouse, Barnaby Feder, & Gardiner Harris, "Justices Shield Medical Devices from Lawsuits," THE NEW YORK TIMES, Feb. 21, 2008.

Id.

Mark Baard, "Lawmakers Alarmed by RFID Spying," WIRED, Feb. 26, 2004.

Baard, *supra* note 104.

Senate Bill 682 (California).

"The Right to Be Left Alone," SAN FRANCISCO CHRONICLE, Aug. 25, 2005.

Assembly Bill 290 (Wisconsin).

See <http://www.rfidjournal.com/article/articleview/2304/1/1/>; <http://www.newswithviews.com/McIntyre/Liz6.htm>.

Morrissey, *supra* note 5.

Id.; Senate Bill 362 (California).

<http://www.raidersnewsnetwork.com/full.php?news=2726>; <http://www.okpubtoday.com/>; http://www.legislature.state.oh.us/bills.cfm?ID=126_SB_349; [http://www.leg.state.co.us/clics/clics2007a/csl.nsf/billcontainers%20/CBC12C68118CE43787251007B703D/\\$FILE/1082_01.pdf](http://www.leg.state.co.us/clics/clics2007a/csl.nsf/billcontainers%20/CBC12C68118CE43787251007B703D/$FILE/1082_01.pdf); http://www.flsenate.gov/session/index.cfm?BI_Mode=ViewBillInfo&Mode=Bills&SubMenu=1&Year=2007&billnum=2220.

Cf. LORI ANDREWS, FUTURE PERFECT, New York: Columbia University Press, 2001.

Id.

Id.

Id.

In fact, the FDA has recently come under criticism for its overly permissive standards and procedures in approving new medical products for the marketplace.

Id.

Id.

Id.

Id.

Id.

See relevant discussion in Section II.B.

See, e.g., Elaine M. Ramesh, *Time Enough? Consequences of Human Microchip Implantation*, 8 RISK: HEALTH SAFETY & ENV'T 373 (Fall, 1997).

Cf. ANDREWS, *supra* note 136.

See, e.g., *supra* note 121.

"Compelling interest" is probably the appropriate standard, since microchipping potentially infringes on such fundamental rights of privacy and bodily integrity.

Cf. ANDREWS, *supra* note 136.

Id.

See relevant discussion in Section II.B.

Cf. ANDREWS, *supra* note 136.

Id.

Id.

Id.

See relevant discussions in Sections II.C.1 and II.C.2.

Some argue that microchipping of sex offenders would constitute a valuable exception to this general statement. After U.S. Postal Inspection Service investigators forwarded British law enforcement a list of 7,000 suspected pedophiles, Britain's Observer reported that its government was considering plans to implant sex offenders, using microchips in tandem with satellite technology to track their every move. The British government proposed that, in addition to the chip's tracking abilities, its ability to monitor of an offender's heart rate and blood pressure could alert authorities that "another attack was imminent." Martin Bright, "Surgical Tags Plan for Sex Offenders," THE OBSERVER, Nov. 17, 2002, <http://www.guardian.co.uk/society/2002/nov/17/childrenservices.crime>.

See relevant discussions in Sections II.C.1 and II.C.2.

Cf. ANDREWS, *supra* note 136.

Id.

Id.

Id. Studies show recent examples of genetic insurance discrimination; 31 percent of people in families with known conditions have been denied health insurance coverage because of their genetic status, even when they were healthy. Some genetics research subjects who learned of their own genetic conditions have lost their health insurance as a result. *Id.*

<http://www.medicalnewstoday.com/articles/47480.php>.

<http://www.antichips.com/is-the-threat-real.htm>.

Cf. note 58, *supra*.

See *supra* note 26.

Cf. ANDREWS, *supra* note 136.

Some Christians regard microchip implants as the sign of the start of an "age of evil" as described in the Bible's Book of Revelation 13:16-18 — a time during which everyone is forced to physically accept the "Mark of the Beast" in order to conduct any financial transactions under the government of the Antichrist. Believers see this prophecy, in which everyone must receive the Mark of the Beast "in their right hand or in their foreheads," supported by the fact that many implantees have received the microchips in their right hands. The Associated Press/CNN, "Microchips in Humans: High-Tech Helpers or Big Brother Surveillance?," CNN.COM, Aug. 1, 2007; KATHERINE ALBRECHT & LIZ MCINTYRE, THE SPYCHIPS THREAT: WHY CHRISTIANS SHOULD RESIST RFID AND ELECTRONIC SURVEILLANCE (2006); <http://users.cybertime.net/~ajgood/chipindex.html>.

Id.

Cf. ANDREWS, *supra* note 136.

See relevant discussion in Section II.C.2.b.

Cf. ANDREWS, *supra* note 136.

Id.

Id.

Id.

See relevant discussion in Section II.C.1.

See note 160, *supra*.

Cf. ANDREWS, *supra* note 136.

Id.

Id.

See relevant discussion in Section III.B.1.b.

Cf. Catherine Powell, American Constitution Society (2008).

“Presidential Task Force on the Employment of Adults with Disabilities, (PTFEAD)” <http://www.workworld.org/ptfead.html>.

Cf. Powell, *supra* note 205.

Id.

Id.

Id.

Id.

Id.

Id.

Id.

Id.

Id.

Id.

Id.

Id.

Id.

Id.

Id.

Id.

Id.

See relevant discussion in Section II.B.

Cf. Powell, *supra* note 205.

Hayes, *supra* note 86.

Id.

Id.

Id.

See relevant discussion in Section II.B.

See relevant discussion in Section II.B.

See relevant discussion in Section II.C.2.b.

See relevant discussion in Section III.A; Trials of War Criminals, *supra* note 119.

See relevant discussions in Section II.C.2.

See relevant discussion in Section II.B.

See relevant discussion in Section II.C.1.

See relevant discussions in Section II.C.2.

Cf. ANDREWS, *supra* note 136.

Hayes, *supra* note 86.

PAGE

PAGE 1

